

# Chelmsford Amateur Radio Society.

NEWSLETTER No.293

Callsign G0MWT

June 1990

## H.F. FIELD DAY 1990.

This Newsletter should reach you in time to spread the word of the final details for the big event.

The venue is the same as in past years, Howletts Hall Farm on the Blackmore/Highwood road, map ref. TL616018.

Helpers to erect the station will be welcome on site at 9.00am on Saturday, in case the weather becomes inclement wellies and an anorak are advisable.

To vary our attack on the propagation we are using wire antennas only this year also we shall be using the Society's callsign G0MWT which we hope will bring us lots of luck.

For any final arrangements or offers of help, please contact Dick, G3WHR on 0621-891868 or Gwyn, G4FKH on 0245-260831. VISITORS TO THE STATION WILL BE VERY WELCOME.

## NEXT MEETING - Constructors' Competition.

How time flies! one of the regular events in our calander has come round again.

No doubt members have been beavering away during the winter, preparing their entries for the rest of us to learn about and enjoy viewing at the meeting on Tuesday 5th June.

Paying particular attention will be Brian, G3CVI and Dick, G3WHR who have kindly agreed to be our official judges for this years competition.

Depending on the number of entries, the prizes will be £7, £5 and £3 for 1st, 2nd and 3rd respectively, in addition and at the discretion of the judges a £3 'Novice' prize may be awarded to the best entry from a member who has not previously won a prize.

Note: Will competitors please provide a card describing their entry - these will be used by Harry G2HPF to aid his report for the next Newsletter

The meeting starts at 7.30pm at The Marconi College, Arbour Lane, Chelmsford.

## DATES FOR YOUR DIARY.

2/3 June NATIONAL FIELD DAY 1990 - Howletts Hall Farm.

5 June CLUB MEETING - Constructors' Competition.

3 June SOUTHEND & DISTRICT A.R.S. MOBILE RALLY.

3 July CLUB MEETING - What's Amateur Radio got to do with Bee Keeping? G3EDM.

## NFD SPONSORSHIP - Andrew G4KQE.

The response to the Sponsorship of NFD this year has been very encouraging. On behalf of the club I would like to thank all those members who have signed the form so far, bringing the sponsor to 14p per QSO with one or two extra amounts pledged on top of that.

The form will be available over NFD weekend on site at Blackmore and again at the club meeting on 5th June (by which time we will know how many QSO's have been made).

If any one would like to pledge support in the meantime, I will be pleased to hear from them on 0376-83094.

Thank you for your support.

## LAST MONTHS MEETING - Three Mini-Lectures.

### 1) BOX BASHING FOR BEGINNERS - Christopher G0IPU.

I hope that my short lecture was interesting and some useful information was conveyed. I would have liked to cover the CNC approach to professional instrument casing in more depth but time was limited.

The most important thing to remember about all home box bashing (construction) is to allow for the thickness of the material on the bending when developing the size of the case. Were on a simple base with two bends to form a "U" type base, and the outside size is required, four thicknesses of material must be subtracted from the total of the three sides added together. EG. A base of 40mm high, 100mm wide, 130mm long would have a developed size of  $40+40+130 = 210-4x$  (thickness of material) 20SWG or 1mm, so the developed size is 100 x 206.

The lid is made to outside dimensions and need not have any thicknesses of material subtracted from the developed size but a clearance added of 0.5mm on the sides and top to allow for any discrepancy in the base. With four bends in of 10,40.5,100.5,40.5,10 = 201.5 and bent using a scribed line, emphasised with a cold chisel to make easy bending.

Bending is done in the vice using mild steel angle, the material of the job clamped in between them in the vice. Using a block of wood and by hand slowly put the bends in and finish the bend with a good clean hammer carefully.

The bending of a case and cutting holes is not easy at home, holes can be drilled before or after bending but before is best, Square holes can be chiseled through on a block or by using the angles.

A brief description of the tools for punching and cutting was then given. The finish can be paint or plain, if paint spraying then warm the case slightly first.

**WARNING! NEVER WELD NEAR CELLULOSE FUMES AS CHLORINE GAS IS PRODUCED!**

The talk was an experience for me and I hope some useful information was given. The methods shown are not the only way but I thought the simplest for the shed environment.

LAST MONTHS MEETING - continued.

## 2) TERMINAL DISEASES - Roy G3PMX.

My 25 minute talk was designed to encourage members to obtain the best results from their amateur equipment by reducing the losses in the transfer of RF power from the transmitter to the antenna.

No matter how much money or effort is put into the station, the overall system will fail if only part of the RF power reaches the antenna.

Most transmitters are now designed to deliver maximum power into a 50 ohm load and the standard is to fit a 50 ohm connector on the rear panel. If we connect this to a 50 ohm resistive load via an SWR Meter we have the ideal situation with all the power delivered to the load and none in return, however, this will not communicate! Replacing the load with an antenna other than 50 ohm impedance will result in bad SWR.

The effects of bad SWR are :- distortion of the antenna radiation pattern, an increase in the RF field in proximity to the radio shack which can cause interference problems and residual RF turning into heat. With only a few exceptions the impedance of an antenna is rarely 50 ohms but with the aid of minimum loss matching it is possible to overcome the problems.

Matching is best achieved with transformers using low loss components in the form of parallel/series tuned circuits, baluns and quarter wave sections of selected impedance cables. The formulae for calculating the characteristic impedance of coaxial and open-wire feeders was discussed before moving on to the logical approach to matching an antenna system.

With the exception of the G5RV design, I recommend that the matching device should be at the antenna end of the feed line (to avoid the feeder becoming part of the radiating system), the step-by-step procedure being :-

- 1) Check the power output of the transmitter and the SWR of the load immediately next to the transmitter (including the low-pass filter if required).

- 2) Attach the length of feeder to be used in the system and terminate with the load at the far end; measure the SWR at the near end and the power loss at the far end.

- 3) With the SWR meter at the far end, replace the load with the antenna and measure the SWR.

- 4) Determine the amount of matching required (a noise bridge can be useful here) and fit the transformer between the SWR meter and the antenna.

- 5) Repeat the SWR measurements both at the far and near ends. The difficulty here is to support the SWR meter up with the antenna but it can be done with ingenuity.

At this point the question was raised regarding the use of half wave multiples of measuring cable to bring the effective feed point down to ground level; this can be done but has the complication that the cable electrical length changes with frequency and can make the final calculation of the matching transformer very difficult.

Examples of antennas convenient for amateur use were then described.

- a) THE END-FED WIRE. This has the advantage of being multi-band and can be matched within reach of the operating position. The important considerations here are the provision of a good earth or counterpoise and the antenna wire having a clear take-off away from the shack. Models of 20m and 40m Tuning Units for my 132ft wire were demonstrated.

- b) THE HALF-WAVE HORIZONTAL DIPOLE. When cut 5% short on electrical length this antenna is a good match to 50 ohm coaxial cable and will remain at low SWR for a wide portion of an amateur band, i.e. CW or Phone segments. With care on spacing it is possible to attach several dipoles to one feed-point and make it multi-band.

- c) THE ELEVATED GROUND-PLANE. Without any compensation, this is a truly 50 ohm device. It should be at least half-wave above the ground and the 3 or 4 radials should be at 30 degrees to the vertical. In its basic form it is single band, although it is omni-directional it often out-performs the dipole for dx because of the low angle of radiation. An anti-corona disc should be fitted at the top to overcome the annoying QRN that results from static discharge.

Finally, a brief summary of connectors for amateur use was given:-

BNC, TNC, UHF (PL259), Type-N, Phono and Belling-Lee.

The factors for consideration when choosing a connector are:- Contact resistance, characteristic impedance (inner/outer diameter), dielectric material and cable clamping.

Top of the range is the Type-N which also is the only low priced waterproof connector and when correctly fitted can be used up to 4GHz. The BNC and TNC are good for general purpose connection up to 1GHz. with easy-to-use cable clamping. The UHF (PL259) is very varied in quality, the current Japanese (available at Rallies), have a very low melting point dielectric and in general do not cable clamp (except in the Greenpar design) it is a 60 ohm device but its electrical length is short so it can be used without causing any SWR problems below 200MHz. The Phono is also very varied in quality and should only be used for audio and low power RF below 10MHz. The Belling-Lee is the most underrated connector; originally designed for TV cables it has been widely used from audio to 1GHz., its only downfall is that very few people know the order of assembly; if you are in any doubt see Radio Communication March 1990, page 33.

## 3) MAKING LIGHT WORK OF IT - Brian G0BDS.

My mini-lecture, having nothing to do with radio in any shape or form, came last on the evenings programme, so that the subject was still on members minds when they drove home after the meeting.

continued:-

#### LAST MONTHS MEETING - continued.

The need for street lighting has been required for centuries, but it is only nowadays that most people look to good lighting to reduce crime or the fear of crime and save nighttime road accidents as well.

Some people, however, are never satisfied and two of the letters I read out clearly demonstrated the divide between the need by some to have lighting and the rejection by others who prefer the darker side of life.

With the average road accident fatality costing the nation as a whole £500,000 then it is reasonable to attempt to save 30% of the nighttime road accidents by installing proper street lighting.

The modern schemes of lighting are calculated with the aid of computers naturally and within the guidelines of the various British Standards. My Authority, like all the others, looks for the lowest cost option to achieve the desired specification for installation and the best economy for light output. Therefore, the use of Low Pressure Sodium lamps giving an orangey-yellow light and more Lumens per watt are favoured (typically between 70 and 170 Lum/Watt) compared with a Tungsten lamp of between 10 and 25 Lum/Watt. Other types of lamp giving a whiter light are used in places where better colour rendering is required like High Streets etc.

The mains supply cable to the lighting columns is either Electricity Board or Local Authority owned and if Authority owned will now be designed with Volt Drop, Prospective Fault Current and Earth Loop Impedance, carefully calculated to ensure a safe and reliable network should a fault develop or nuisance tripping be avoided. Just as a guide there are approx: 130,000 street lights in Essex with an annual energy bill of £2,000,000.

#### DF NEWS - Dick G3WHR.

##### Part 1.

The first Chelmsford event took place on Friday 20th April with me as hidden station. I had chosen a site on the old railway track south of Cold Norton (by kind permission of the land owners) for G3WHR/P.

It was a rather damp night and a shower of rain just after the start caused problems with the aerial. A quick change of transmitter position and a new Tee-in had little effect; the trouble was leakage to earth from the main aerial.

By now the first competitors were close so I persevered with the variable VSWR until the first team arrived, then switched to a hastily erected quarterwave. Unfortunately the only length of spare wire was coloured light blue, O.K. for dummy aerials, which led the remaining teams to the transmitter.

##### Results:-

1 Philip Cunningham	4 Daphne Mead
2 Alan Williams	5 Peter Graves (Pub only)
3 Roy Emeny	

##### Part 2.

The second Chelmsford event was on the 18th May when Peter Larbalestier provided the hidden station. We expected the start bearing to go near Halstead, and it did. My second bearing from Coggeshall was divergent! but the 8 p.m. transmission pinpointed the river bank near Earls Colne.

I ran into the site with Philip alongside, but whereas he found Peter very quickly, I was not alone in having difficulty. A couple of dummy aerials were soon eliminated but the presence of some power lines provided a very strong signal near the old railway track. After much bush beating and in fading light it became obvious that I WAS alone in having difficulty, everyone else had been in. After some pointed remarks by Peter I was just able to find him before the end of the contest, but the points had long gone.

##### Results:-

1 Philip Cunningham	8.23	6 John Hawes	8.54
2 Peter Graves	8.49	7 Roy Emeny	8.55
3 Andy Collett	8.50	8 Alan Williams	8.57
4 Richard Whitney	8.51	9 Dick Brocks	9.00
5 Daphne Mead	8.52		

#### OTHER DF NEWS.

Our club has been well represented in the National Events. There was no joy for us at Northampton, but at Salisbury Andy Collett was the winner with Paul Clark 6th and Andrew Mead 9th.

Plans for our qualifying event on July 29th are well advanced. This year we will be using the Ipswich map OS169.

#### FUTURE EVENTS.

1 June Colchester.	10 June RSGB Mid-Thames.
24 June RSGB Banbury.	30 June Colchester.

#### JUNK SALE POSTSCRIPT.

Would the purchaser of the TRIO JR-60 receiver at the last junk sale please contact Roy or Ela as we have the circuit diagram for you.

#### G0MWT OPEN DAY - Gwyn G4FKH.

This auspicious event was held at Roy and Ela's QTH on Saturday 28th April. The event was to commemorate our clubs call sign. G0MWT was chosen because of the historical link with the Chelmsford based company. (Marconi's Wireless Telegraph Co. Ltd.).

The weather was excellent, Roy obviously ordered it early. I arrived at 10 a.m. to find that Roy had everything ready, in fact he was cleaning his shack. H.F. bands 80-10m were available as well as VHF/UHF/SHF. The 40m station was located in their greenhouse with a sheet over the part where the sun struck to keep the operating space cool. The bands were not in very good shape but plenty of visitors turned up during the day and took part in various discussions. Altogether 36 adults and 3 children came for a looksee.

The lucky ones who were there at lunchtime were treated to an excellent spread put on by Ela. In fact refreshments were available throughout the day courtesy the Martyr's.

The sked with our twin town "Backnang" took place in the afternoon on SSB, with good signal reports in each direction.

All in all it was a fun day and I think that everyone enjoyed it very much. Thank you Roy and Ela.

A BIG thank you from Ela for various goodies received and to the ladies who kindly helped with the washing up.

#### LETTER TO THE EDITOR.

Dear Editor,

Band Summary of Newsletter 291, showing Club interests:-

Heading	HF	VHF	UHF etc.
Next Meeting - Aerials for restricted sites	✓	?	X
Diary dates	-	-	-
RSGB Exhibition	-	-	-
Planning for Field Day 1990	✓	X	X
Society's Callsign - Club net	✓	X	X
Twinning Chelmsford/Backnang	✓	X	X
Last Meeting - DF (VHF DF does exist)	✓	X	X
International Marconi Day	✓	X	X
Special Event Station	11 lines	3 lines	X
Packet Radio	✓	✓	X
Committee Meeting	-	-	-
Constructional article	✓	X	X

I make no further comment other than that it would be interesting to count the Classes of members who actually attend club meetings. I am sure the newsletter editors would welcome any reply! John G6JPG.

Dear John,

In reply to your letter, 34 Class A Licence holders, 3 Class B and 1 SWL attended the last meeting, assuming that everybody signed the book. The membership for this year is 60 Class A, 15 Class B and 2 SWL's. Out of the last 12 meetings 4 have VHF connections, July - VHF Contests, (your signature is not in the book John), August - Rig testing, November Sporadic E and February - Debate. Your comments on the heading "Society's Callsign" only gives a tick for HF, This paragraph also mentions our Open day, this will involve equipment for HF, 6M, 2M, 70cms and 23cms. Ela, G6HKM.

#### INTERNATIONAL MARCONI DAY 1990.

The Society's Callsign was activated by G3PMX for this event on 21st April and successful contacts were made with:-

VE1IMD, EI2IMD, IY4FGM, GB0IMD, GB2IMD, GB4IMD, IY0TCI, IY1TTM, DA0IMD, GB2MDI and GB4MDI.

We hope that this score will qualify G0MWT for the prestigious award, if so it will be displayed on our club noticeboard in the near future.

#### SIX METRES - Ela G6HKM.

This year we have seen an increase of European countries on the band, they are D, HB9, I, LX, OE, ON, OY and OZ, plenty of scope for the locator square hunter. I am pleased to report that the Sporadic E season has started on this band and livened things up a bit, over the last few days I have worked CT, F, I, OE, OH, ON, OZ, SM and 9H. I have worked I0CUT so I hope that Les G4CUT meets up with him soon.

With 6m its a case of being in the right place at the right time!

#### SILENT KEY.

News from Canada records with deep regret the death of Mike Barlow ex. G3CVO. Mike who lived in Great Baddow during the 1950's was a very creative engineer and a founder member of the British Amateur Television Club.

#### COMMITTEE MEETING.

The June Committee Meeting will be held in the Telford Lodge (Marconi College Residence) at 7:30pm on Wednesday, 13th June. You are most welcome to join us.

73 from Roy & Ela Martyr, G3PMX & G6HKM

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